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P A P E R

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C H E M I S T R Y.

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IT has long been the ardent wish of every humane mind to alleviate, if possible, the evils which arise to the industrious Labourers in those manufactures where the health of the Workmen is liable to be injured by the nature of their employment : among these stands foremost, the making WHITE LEAD ; and the horrible complaints to which the workmen are subject in that manufacture, and which principally arise from the dust of the corroded lead, will be in a great degree prevented by the practising a method described in the following Paper. The Society, fully satisfied of its utility, have this Session voted their GOLD MEDAL to Mr. WARD, the inventor, for his ingenuous communication of it to the Public ; and a complete Model is reserved in the Society's Repository.

SIR,

SIR,

OBSERVING that, among the various Premiums offered by the Society for the Encouragement of Arts, Manufactures, and Commerce, one is mentioned for discovering a method of preparing White Lead that shall not be prejudicial; I take the liberty to send you a drawing of my invention, to prevent the ill effects to the working people in preparing White Lead.

In order to explain, as well as I can, the advantage that will accrue to the workmen in adopting my invention, in preference to the common mode of preparing White Lead, I will first state what the common mode is. When blue lead is in part corroded in the stacks, by an acid raised by a considerable degree of heat, brought on by horse-litter, the corroded and uncorroded lead are taken from the stacks to a room called the engine-loft, where a pair of iron rollers is fixed with a screen under them:
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the lead in this state is passed through the rollers and screen; from the motion of these rollers and screen, by which the White Lead is separated from the uncorroded or blue lead, together with the moving the lead in order to its being passed through them, a very considerable quantity of fine dusty white lead is raised, which almost covers the workmen thus employed, and is very pernicious to them. And not only in this part of the process are they liable to be thus injured; but they are again exposed to the dusty lead, by removing the blue lead from the screen-house to the furnace, as there still remains a quantity of the fine particles of White Lead, which of course rises in the removing it; and in removing the White Lead also from under the screen to the grinding-tub, a quantity of the dust arises, which is very detrimental to the people so employed.

My invention removes all these difficulties respecting the dry dusty white lead, so very injurious to the health of the working people:

people; and consists of a vessel, as shewn in Plate No. 2, twelve feet long, six feet wide, and three feet ten inches deep. In this vessel is fixed a pair of brass rollers in a frame, one roller above the other: the centre of the rollers is about ten inches below the top of the vessel; and one inch lower, is a covering of oak boards or riddles, an inch thick, fixed in the inside of the vessel in a groove, so as to be taken out occasionally: these boards are bored with a centre-bit as full of holes as may be, without danger of breaking into each other; the size of these holes is, in the machine at large, about five eighths of an inch diameter. This being done, the vessel is filled with water about three inches above the oak boards or riddles; the lower brass roller is now under water, and about half of the upper roller is under water also: thus the lead coming from the stacks is put through the brass rollers in water, and by raking the lead with a copper rake over the
oak

oak boards or riddles, the white lead passes through the riddles, and the blue lead remains above; which being taken out, is thrown upon an inclined plane of strong laths to drain; where it remains about twelve hours, when the blue lead is ready for the furnace to be remelted: by this means no dusty white lead can rise in any part to the work people. No such plan as this (although long desired) has, to my knowledge, been put in execution, so as to answer all the purposes above stated. It may be asked, why the lead in the common mode is not made wet before it is passed through the rollers and screens? Should this be done, the lead would be a paste on the rollers and screen, and the white lead prevented separating from the blue lead, which is absolutely necessary in the preparation of white lead.

Should this invention meet the approbation of the Society, I shall feel myself happy in having contributed to the relief of
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the working people employed in the manufacturing of White Lead.

I am, SIR,

Your very humble servant,

ARCHER WARD,

Derby White-Lead Works.

Jan. 2, 1795.

MR. MORE.

Three Samples accompany this.

No. 1. contains a sample of White Lead, as first taken from the stack.

No. 2. contains a sample of White-Lead dust, after it has passed through the brass rollers, and separated from the blue lead.

No. 3. contains a sample of White Lead completely manufactured.

These several samples are reserved in the Society's collection for the use of the Public.

I DO hereby certify that the White Lead made at the manufactory at Islington, belonging to Walker, Ward, and Co. is, and has been for some time past, manufactured in the manner as stated by Mr. Ward, in his letter, addressed to Mr. More, and that many tons have been manufactured; and that, since Mr. Ward's plan was adopted, no other method has been used.

Witness my hand, this 19th day of January, 1795,

SAMUEL WALKER PARKER.

I HAVE had the pleasure of examining the foregoing invention, and think it a very valuable improvement on the general mode of preparing White Lead: I am very sure it must be the means of preserving the health of the operator in that branch, and of course an acquisition to a great number of

of manufacturers. The quality of the lead is not in the least injured by it ; and a sample has been shewn to me, equal to the best white lead I ever saw.

H. BROWNE.

Irongate, Derby.
Jan. 2, 1795.

Fig. 1.

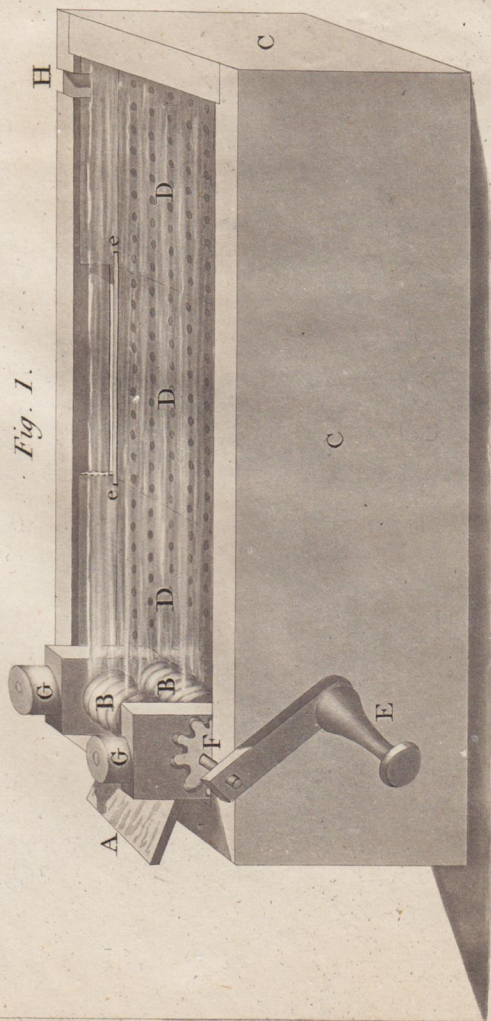
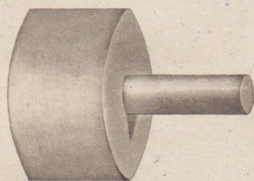


Fig. 2.



M^r Usher Ward's Machine for preventing Dust arising in the Manufacture of White Lead.

*Explanation of the PLATE of the MODEL
of Mr. ARCHER WARD'S MACHINE
for preventing the ill Effects to the Work-
men from the Dust arising in the manu-
facturing WHITE LEAD.*

Fig. 1. A. An inclined plane of wood on which the White and Blue Lead is placed, immediately from the stacks, and thus introduced between the brass rollers B. B.

C. C. The vessel containing water.

D. D. D. The pierced oak boards or riddles, which, by being made to slide in grooves in the sides of the vessel C. C, may occasionally be taken out by removing the wooden bar, e. e.

E. A handle or winch, which, in the machine at large, may be a wheel communicating to the mill-work, and thus turning the rollers, B. B.

F. A pinion fixed on the gudgeon of the upper roller, and communicating with a similar pinion on the arbor of the lower roller,

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roller, keeping both of them in motion by the turn of the handle: as it is necessary that the upper roller should be at liberty to rise or fall, in order to give a due degree of pressure to the lead in passing between the rollers, two weights, G.G. with proper stems to them, (as shewn more at large, fig. 2.) are placed over the gudgeons of the upper roller, thereby keeping a due degree of pressure; and if any piece of the lead should be thicker than usual, admitting the roller to give way to it, and thereby preventing any injury to the machinery.

H. A notch in one side of the wooden vessel, serving to regulate the depth of the water on the riddles, D. D. D.

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